

2.0 Preferred Alternative

2.1 Selection of the Preferred Alternative

During Phase I of the alternative development and evaluation (DEIS, Section 3.0), the project corridor was initially divided into six sections to provide a thorough examination of preliminary study alternates relative to the social, economic, and physical landscape, and the stated project goals and objectives. The number of preliminary study alternates was reduced through the examination of potential impacts, engineering considerations, and the projected ability to meet the stated transportation goals and objectives outlined in the project Purpose and Need (DEIS, Section 1.0). As a result, these six sections were subsequently reorganized into four sections for Phase II of the alternative development and evaluation. The following paragraphs describe the preferred alternative during the second phase, which utilized the (reorganized) four sections of the U.S. Route 34 project. A description of alternatives that were considered and reasons why they were dropped from additional consideration are provided in Section 3.0 of the DEIS.

2.1.1 Section I (Carman Road in Gulfport to TR94)

The preferred alternate for Section I is Alternate 1M2B. Six build alternates, 1B2B, 1E2E, 1F2C, 1H2C, 1I2E, and 1M2B (Figure 2-1) were evaluated for Section I. The preferred alternate, 1M2B, connects to the recently completed four-lane improvement west of Carman Road, includes a new interchange with Carman Road (Figure 2-2) and continues east along the existing right-of-way until approximately CH15. At this point, Alternate 1M2B angles northeast paralleling and west of existing U.S. Route 34. Alternate 1M2B then turns east along existing U.S. Route 34 holding the south right-of-way line, crossing the bluffs of the Mississippi River at approximately Illinois Route 164. Immediately west of the Illinois Route 164 intersection, a future interchange is proposed (see Figure 2-2). Continuing to the east, Alternate 1M2B uses existing right-of-way and then just begins to veer to the southeast immediately west of TR94.

The advantages of Alternate 1M2B included the following:

- Requires only one interchange for the design year (a second interchange serving Illinois Route 164 and TR66 may be warranted at some future date);
- Displaces the least number of non-farm residences and second least number of total residences;
- Affects access for a lower number of businesses/residences;
- Utilizes a high amount of existing right-of-way;
- Affects a lower number of owners and operators; and
- Severs a low number of farm operations by tract.

2.1.2 Section II (TR94 to TR26 at the West Edge of Kirkwood)

The preferred alternate for Section II is Alternate 3G4B. Five build alternates, 3C4C, 3E4B, 3G4B, 3H4C, and 3I4B (see Figure 2-1), were evaluated for Section II. The preferred alternate at TR94, 3G4B, diagonals southeast to a line approximately 0.8 km (0.5 mi) south of existing U.S. Route 34 near TR102 where the alignment turns due east along property lines south of Union School and south of Biggsville. An interchange is proposed where the route intersects Illinois Route 116/Illinois Route 94, south of Union School and the IDOT maintenance facility (see Figure 2-2). At approximately TR150, Alternate 3G4B turns northeast until meeting the existing right-of-way near TR190. The alignment then carries east along existing U.S. Route 34 holding the south right-of-way line to approximately TR26 just south of the west edge of Kirkwood.

The advantages of Alternate 3G4B include the following:

- Relatively high amount of existing right-of-way;
- Relatively low amount of floodplain encroachment;
- Relatively low number of owners and operators;
- Least woodland impacts;
- Least wetland impacts;
- No major utility impacts;
- Safer access to Union High school;
- Fewer stream crossings;
- Fewer uneconomical remnants;
- Less borrow excavation; and
- Fewer median openings resulting in safer, more efficient travel for through traffic.

2.1.3 Section III (TR26 to U.S. Route 34/67 Interchange)

The preferred alternate for Section III is Alternate 5B. Six build alternates, 5A, 5B, 5C, 5E, 5G, and 5H, (see Figure 2-1) were evaluated for Section III. The preferred alternate, Alternate 5B holds the south right-of-way line for existing U.S. Route 34 just east of TR26 and remains adjacent along the existing 'S-curve' around Kirkwood and then easterly along existing U.S. Route 34 holding the south right-of-way until the U.S. Route 34/67 intersection. The existing interchange at U.S. Route 67 will be modified slightly to improve the design speed of the predominant ramp movements, eastbound to northbound and southbound to westbound, and add a ramp for westbound to northbound traffic eliminating a left turn movement, while minimizing impacts to the existing bridge structure (see Figure 2-2).

The advantages of Alternate 5B include the following.

- Requires only one interchange;
- Impacts are relatively low amount of productive farmland;
- Affects the lowest number of farm owners and operators;
- Utilizes a relatively high amount of existing right-of-way;
- Impacts the lowest amount of wetlands;
- Crosses the fewest number of intermittent streams;
- Avoids impacts to woodlands;
- Severs the lowest number of farm operations;
- Requires considerably less borrow excavation; and
- Requires reduced total length of access road.

2.1.4 Section IV (U.S. Route 34/67 Interchange to East of Monmouth)

Monmouth improvement concepts were developed which included freeway and expressway concepts. The preferred concept was the upgraded, expressway concept. Improvements to the existing four-lane facility from the U.S. Route 34/67 interchange, around Monmouth to the project's east terminus east of Illinois Route 164 will involve implementation of TSM actions including intersection improvements at West Broadway, West Harlem, North Main, North 6th Street, and North 11th Street, and rehabilitation of the existing pavement (see Figure 2-2). Intersection improvements may include new traffic signals, traffic signal modifications, additional turn-lanes, and access control improvements to the side roads such as relocation of access drives.

The advantages of an expressway concept include the following:

- Reduced accident potential on U.S. Route 34;
- Less adverse travel;
- More points of access;
- Significantly less right-of-way required;
- No residential or commercial displacements;
- A more easily phased construction;
- No Section 4(f) involvement; and
- Significantly lower cost.

2.1.5 Summary of Preferred Alternative

The evaluation of consequences of each of the study alternates resulted in the recommendation of a single preferred alternative that also implements ITS and TSM elements within the Monmouth Area. The preferred alternative consists of Alternates 1M2B, 3G4B, 5B, and the upgraded, expressway concept at Monmouth (Figure 2-2).

Several points of access will be maintained including median crossings at state, county and township roads and at certain residential and farm entrances identified as being necessary to facilitate the movement of farm equipment. The cross roads to remain open include Carman Road (with an interchange), TR38, TR127 (850E), CH15, existing U.S. Route 34 connection, TR66, Illinois Route 164, TR112 (Bogus Hollow West), TR111 (Bogus Hollow East), TR94, Illinois Route 94/Illinois Route 116 (with an interchange), TR138, TR150, TR178, TR190, CH2, CH1, TR210, TR4, TR18, TR26, CH11 (Smithshire Road), TR157 (Walnut Street), SBI 8 (Kirkwood Road), TR48, TR62, and TR70. The U.S. Route 67 interchange will also remain open. Only three intersections with direct access to existing U.S. Route 34 will not have direct access with the proposed improvement. These locations include TR137A, west of Carman Road, but within 1,500 m (4,921 ft) of the Carman Road westbound entrance ramp; TR102, west of and within 1,500 m (4,921 ft) of the Illinois Route 94/Illinois Route 116 interchange ramp; and TR122, east of and within 1,500 m (4,921 ft) of the proposed Illinois Route 94/Illinois Route 116 interchange. At Carman Road, TR137 north of Route 34 and west of Carman Road will be re-connected to provide access to the subdivision west of Carman Road on the north side.

ITS facilities at Monmouth will include signalization and signal modernization and potentially installing additional cameras to monitor the major interchanges for weather conditions and traffic delays. These items will be incorporated into the Phase II contract plans at locations that will benefit from this technology.

The right-of-way needed to construct the preferred alternative includes 240 ha (593 ac) of existing IDOT right-of-way and 278 ha (687 ac) of new right-of-way.

2.2 Wetlands – Only Practicable Alternative Finding

Presidential Executive Order 11990, Protection of Wetlands, issued May 24, 1977, directs federal agencies "...to avoid to the extent practicable long and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative....". The following sets forth the basis for this finding for the U.S. Route 34 project.

2.2.1 Impacts

Impacts to wetlands by the preferred alternative (Figure 2-3) were evaluated for direct and indirect losses as well as cumulative impacts. Direct losses, discussed below, include the actual area of wetland that would be filled, excavated, or drained during construction. Indirect losses are those in addition to direct fill or excavation that could result from project-induced alterations because of factors such as drainage, erosion or sedimentation. Indirect impacts will be minimized through adherence to IDOT's Special Provisions for Project Erosion Control Systems. Cumulative impacts are those effects that, taken individually, may be minor, but collectively could be significant.

Wetland impacts associated with the preferred alternative are summarized in Table 2-1. The preferred alternative will affect five wetlands comprising a total wetland impact of 0.17 ha (0.42 ac). Section 2.9 of the DEIS provides a full description of all project corridor wetlands.

Table 2-1. Wetlands Impacts by New Right-of-Way for the Preferred Alternative

INHS #	NWI Classification	Crossing Type	Area Impacted Ha (Ac)	Total Wetland Area Ha (Ac)	Approximate Loss as a % of Total Wetland
40	PEMC	Fill	0.04 (0.10)	0.68 (1.67)	6
41	PEMCh	Culvert/Fill	0.03 (0.07)	0.06 (0.15)	50
54	PUBGh	Culvert/Fill	0.02 (0.05)	0.56 (1.38)	4
105	not mapped	Culvert/Fill	0.04 (0.10)	0.12 (0.30)	33
137	not mapped	Culvert/Fill	0.04 (0.10)	0.05 (0.11)	80
Total Impact			0.17 (0.42)		

Source: INHS Tessene and Machung, 1998 and Harding ESE, 2002.

Wetland #40

Wetland #40 consists of a cluster of nine separate wetlands located along a small tributary to South Henderson Creek north of 150th Avenue and southeast of U.S. Route 34 at Station 104+275 (see Figure 2-3 and Appendix A, Figure A-2). Only one of the nine wetlands will be impacted by the preferred alternative. The wetland that will be impacted consists of a sedge meadow that is seasonally flooded, emergent palustrine wetland (PEMC). This wetland is dominated by emergent species. At this location, the proposed right-of-way would extend east approximately 38 m (124 ft) and thus directly impact the most northwestern wetland in this group. Minimal impacts to the eight remaining wetlands within #40 are anticipated because these wetlands are spatially separate from the impacted wetland. New culverts will be installed at the tributaries of South Henderson Creek (ST-8 and ST-9) (see Figure A-1) in order to maintain hydrology to the remaining #40 wetlands. Indirect impacts to the other wetlands in this group would be minimized by the use of erosion controls measures (i.e., silt fencing, etc.)

Approximately 0.04 ha (0.10 ac) of the 0.68 ha (1.67 ac) or 6 percent of the total wetland area for #40 will be impacted by the preferred alternative.

Wetland #41

Wetland #41 is located along a small stream, south of existing U.S. Route 34 and just west of TR18 at Station 101+575 (see Figure 2-3 and Appendix A, Figure A-3). This wet meadow is an impounded, seasonally flooded, emergent palustrine wetland (PEMCh) and consists of emergent species. At this location, the proposed additional lane is transitioning from north of U.S. Route 34 to south of U.S. Route 34, which would extend the proposed right-of-way south by approximately 11 m (35 ft) and impact a portion of Wetland #41.

Approximately 0.03 ha (0.07 ac) of the 0.06 ha (0.15 ac) or 50 percent of the total wetland area for Wetland #41 will be impacted by the preferred alternative. A culvert will be installed under the preferred alternative to maintain the hydrology to Wetland #41. Indirect impacts to the remaining portion of Wetland #41 south of the preferred alternative will be minimized by erosion control measures.

Wetland #54

Wetland #54 is located east of TR190 and just north of existing U.S. Route 34 at Station 40+900 (see Figure 2-3 and Appendix A, Figure A-4). This pond/marsh is an impounded, intermittently exposed, palustrine wetland with an unconsolidated bottom (PUBGh) and consists of emergent species. At this location an additional lane is proposed north of existing U.S. Route 34, which would extend the proposed right-of-way north by approximately 37 m (120 ft). As a result, the southern most portion of this wetland will be impacted.

Approximately 0.02 ha (0.05 ac) of the 0.56 ha (1.38 ac) or 4 percent of the total wetland area for wetland #54 will be impacted by the preferred alternative. The hydrology sources for this wetland (direct precipitation, sheet flow) will not be significantly altered by the preferred alternative. Therefore, impacts to Wetland #54 wetland hydrology are not anticipated. Indirect impacts to the remaining portion of Wetland #54 will be minimized by erosion control measures.

Wetland #105

Wetland #105 is located along a drainage way just south of U.S. Route 34 and east of TR111 at Station 32+525 (see Figure 2-3 and Appendix A, Figure A-5). This wet meadow was not previously mapped by NWI, and is dominated by emergent plant species. At this location, the Biggsville bypass is just beginning to shift to the south, which would extend the right-of-way by approximately 16 m (53 ft). As a result, the preferred alternative would impact the northern portions of Wetland #105.

Approximately 0.04 ha (0.10 ac) of the 0.12 ha (0.30 ac) or 33 percent of the total wetland area for Wetland #105 will be impacted by the preferred alternative. Direct precipitation and sheet flow are the hydrology sources for this wetland. The impacts to Wetland #105 may result in isolating the remaining sections of the wetland. The sheet flow may be interrupted to the remaining wetland. The maintenance of the wetland hydrology will be considered in the design phase. Indirect impacts to the remaining portions of Wetland #105 will be minimized by erosion control measures.

Wetland #137

Wetland 137 is located along a drainage way north of U.S. Route 34 and west of TR111 at Station 32+100 (see Figure 2-3 and Appendix A, Figure A-6). Although the additional lane is proposed north of existing U.S. Route 34 at this location, steep topography will require additional right-of-way from both the north and south sides of existing U.S. Route 34. The right-of-way to the north would be extended by approximately 30 m (99 ft). As a result, the southern portion of Wetland #137 would be impacted.

Approximately 0.04 ha (0.10 ac) of the 0.05 ha (0.11 ac) or approximately 80 percent of the total wetland area for Wetland #137 will be impacted by the preferred alternative. The surface water flow is from north to south in this wetland. The impacts will be in the southern (downstream) end of Wetland #137. Therefore, significant impacts to the hydrology of the remaining wetland are not anticipated. Indirect impacts to the remaining portions of Wetland #137 will be minimized by erosion control measures.

2.2.2 Avoidance and Minimization

Wetlands are scattered throughout the project corridor and generally occur in low lying areas, side slopes, and ravines, which typically exhibit less disturbance by human activity due to relative difficulty in

converting them to agricultural use. In compliance with the goals stipulated in IDOT's Wetland Action Plan, the Interagency Wetland Policy, Section 404(b) of the Clean Water Act (CWA), and Executive Order 11990, extensive efforts were made to avoid and minimize impacts to wetlands to the extent practicable over the course of the alternative development and evaluation process. A key objective of the alternative development process was to minimize wetland loss in terms of both quality and quantity. Figure 2-3 illustrates the project corridor wetlands in relationship to the preferred alternative.

2.2.2.1 No Action

The No Action Alternative would maintain the existing U.S. Route 34 route and would require only routine maintenance and selective highway improvements. These improvements could include intersection improvements, bridge rehabilitation, or bridge replacements. The No Action Alternative would essentially not impact any wetlands but does not meet the purpose and need for the proposed project.

2.2.2.2 Preferred Alternative

The selection of a preferred alternative was a result of an extensive evaluation process that started with a review of baseline data and project objectives, continued with the development and refinement of alternatives, and concluded with the identification of a preferred alternative that met the objectives outlined in the purpose and need while avoiding and minimizing overall impacts to the human and natural environment. An objective of the alternative development and refinement process was to avoid wetlands and minimize wetland impacts.

An evaluation of the consequences of each of the study alternates resulted in the recommendation of a single preferred build alternate that met the purpose and need. As a result, this was the only alternative carried forward into the DEIS for detailed analysis. Alternates recommended as part of the preferred alternative either avoided wetlands or had the relatively smaller wetland impact.

Pollutant loading to wetlands as a result of normal operation and maintenance is not expected to be significant, and these potential impacts may be minimized. Such minimization measures may include the design of curbs, gutters, and inlets to enhance the retention of grit and other particles by diverting roadway runoff through grass waterways and buffer strips prior to their discharge to nearby wetlands. Additional minimization measures will be accomplished through adherence to IDOT's Special Provisions for Project Erosion Control Systems.

Wetland #40

Previous alignments of the preferred alternative (5B) did not impact this wetland. However, during the public meeting process, local farmers voiced opposition to agricultural land impacts occurring to alternatives west and east of the existing facility. The previous alignment caused considerably greater direct conversions of agricultural land, and created diagonal severances. Ultimately, the public requested that the preferred alternative stay as close to the existing facility as possible.

Complete avoidance has been determined to be not practicable from both design criteria and impact perspectives. This stretch of road occurs within a large S-shaped curve. The alignment of the preferred alternative has been located to allow for the required curve radii both to the south and west (from CH11/FAS413) and to the north and east (east of 165 Avenue). Movement to either the east or west in the vicinity of Wetland #40 (see Figure 2-3, Appendix A, Figure A-2) would cause a "ripple effect" in the location of the alignment of the preferred alternative to the east and to west. The resulting impacts would be relatively high, with increased impacts to agricultural land (including ground used for seed

production), create diagonal severances, cross an increased number of parcels, affect access to Kirkwood, and create the potential for drainage way relocation.

Other alternates developed for Section III (Phase II) avoided wetland impacts including impacts to Wetland #40, but resulted in greater impacts to agricultural land.

Wetland #41

During the development of study alternates, a primary objective was to maximize, to the extent practicable, the existing right-of-way of U.S. Route 34. This objective was identified as a means to avoid and minimize impacts to the environment. Wetland #41 is located south of U.S. Route 34 and west of TR18 (see Figure 2-3 and Appendix A, Figure A-3). To the west of this area the preferred alternative maintains the south right-of-way line to reduce impacts to agricultural land and farming operations, to reduce the number of residential displacements, to avoid impacts to potentially historic structure 27b (see DEIS Section 4.4.2), and to avoid displacing a hog farm operation.

A portion of Wetland #41 is being impacted as the alignment begins to move off the south right-of-way due west of TR26 (between TR4 and TR18) to the south to avoid residential displacements. Additionally, shifting the alignment to the north or the south would impact agricultural land and displace additional residences and farmsteads. Minimization of impact is being practiced through this area as the alignment will impact approximately one-half of the wetland, and the crossing will be designed as perpendicular as possible while still maintaining the required geometric design.

Other alternates developed for this section (Section II, Phase II) resulted in greater impacts to wetlands.

Wetland #54

Constraints issues in the vicinity of Wetland #54, between TR190 and TR210 (see Figure 2-3 and Appendix A, Figure A-4), include agricultural land to the north and south of existing Route 34, residences/farmsteads on the south, South Henderson Creek to the north, and a potentially historic structure (27b) and adjacent hog farm south of CH1 (see DEIS, Figure 4-5 and Appendix C, Exhibit I, Sheets 21 and 22). The alignment through this area must maintain the proper geometrics as the bypass of Biggsville area meets the existing route due east of TR190. Complete avoidance of Wetland #54 was considered impractical due to the resulting impacts to residences, farmsteads, agricultural land, and the potentially historic structure by shifting the alignment of the preferred alternative to the south of existing U.S. Route 34.

Examination of potential alignment alternatives to the north of Wetland #54 indicated relatively high impacts to South Henderson Creek that would arise from multiple stream crossings and impacts to riparian zones.

Impact minimization has been demonstrated by aligning the preferred alternative in such a way to impact the southern limit [0.02 ha (0.05 ac)] of the 0.56 ha (1.38 ac) wetland. Additional impact minimization has also resulted by avoiding impacts to residences and reducing impacts to agricultural land.

Other alternates developed for this section (Section II, Phase II) resulted in greater impacts to wetlands.

Wetlands #105 and #137

An overview of the constraints issues in the vicinity of wetlands #105 (see Figure 2-3 and Appendix A, Figures A-5 and A-6) includes:

- South of Existing Route 34 – Steep topography, woodlands, a creek, an INHS mapped botanical site, observed brown creeper habitat, Bogus Hollow Road, Wetland #105, and four residences; and
- North of Existing Route 34 – Moderately steep topography, agricultural land, Wetland #137, a pond, a cell tower located between TR111 and TR94, and the Biggsville community and potential historic structures to the east. The bypass of the Biggsville community begins in the proximity of TR111.

Build alternatives were examined through the Bogus Hollow area, which involved holding the north and south rights-of-way and evaluating the efficiency and safety of reduced cross sections through the area. Due to the relatively steep topography in the Bogus Hollow areas, the initial alignment of the preferred alternative required the placement of large quantities of fill material south of existing U.S. Route 34. This condition would have resulted in the closing of Bogus Hollow Road as a through road by bisecting the road and creating two dead end streets. Efforts to realign existing Bogus Hollow Road were considered not feasible and impractical due to local topographic and drainage issues, and the likely requirement of multiple creek crossings. In addition, local residents strongly opposed the closing of Bogus Hollow Road as a through road.

A shift in the alignment resulted in impacting a pond (nonjurisdictional Wetland #136) and Wetland #137. Examination of an alignment north of existing U.S. Route 34 indicated that it was not geometrically feasible to maintain the necessary radius of curve through the area as the alignment becomes oriented in an east-southeast direction to initiate the bypass of Biggsville. In this scenario, the pond would still be impacted and the road would be located adjacent and upstream of Wetland #137. The northern alignment also increased impacts to agricultural land by bisecting parcels with the probability of creating additional diagonal severances. This alignment orientation would have also led to four residential displacements, additional impacts to woodlands, and require relatively large quantities of fill.

The current alignment of the preferred alternative through this area avoids the pond, does not result in any residential displacements, is geometrically feasible, avoids the cell tower, results in a partial impact to Wetland #105, and minimizes impact to woodlands. In the direct vicinity of Wetland #105, impacts have also been minimized by utilizing a minimum vertical profile, which has reduced the width of right-of-way required through the area.

Other alternates developed for this section (Section II, Phase II) resulted in greater impacts to wetlands.

2.2.3 Wetland Mitigation

Offsite (out-of-basin) wetland mitigation will be used for compensatory purposes. The mitigation site will be the LaGrange Wetland Bank, located in the northeast corner of Brown County, Illinois, approximately 4.8 km (3 mi) southwest of Beardstown, Illinois. From a hydrologic perspective, the La Grange Wetland Bank is located in the southeastern tip of the LaMoine River drainage basin, and is bounded by the LaMoine River to the north and Illinois River to the east.

Wetland compensation following the guidelines of the Illinois Interagency Wetland Policy Act requires individual wetland impacts measuring less than 1.2 ha (0.5 ac) to be mitigated at an offsite (out-of-basin) ratio of 3.0 to 1.0. Based upon a total wetland impact of 0.17 ha (0.42 ac), the total compensation area measures 0.51 ha (1.26 ac).

2.2.4 Finding

Based on the above considerations, there are no practicable alternatives to the proposed construction in wetlands, and the proposed action includes all practicable measures to minimize harm to these resources.

2.3 Floodplains – Only Practicable Alternative Finding

Based on a review of the available FEMA FIRMs, two mapped base floodplains were found within the project corridor. These base floodplains are associated with the Mississippi River and South Henderson Creek (see Figure 2-3). These locations were reviewed in accordance with Executive Order 11988 Floodplain Management; Code of Federal Regulations Title 23, Section 650, Subpart A; Illinois Floodplain rule, Title 17 IAC 3700 implementing Sections 23, 29a and 30 of the Rivers, Lakes and Stream Act (615 ILCS 5/23, 29a and 30); and Section 26-7, Floodplain Finding in the IDOT BDE Manual of Policies and Procedures (Volume 2, Chapter 26).

As depicted in Table 2-2, the limits of construction for new right-of-way required by the preferred alternative will potentially impact of total of 6.9 ha (17.0 ac) of designated 100-year floodplain (Zone A) with a length of 1,315 m (4,314 ft) or 1.3 km (0.8 mi). There are six floodplain encroachments by the preferred alternative (see Figure 2-3).

Table 2-2. 100-year Floodplain (Zone A) Crossings Associated with Limits of Construction for New Right-of-Way for the Preferred Alternative for U.S. Route 34, Illinois

Floodplain Crossing #	Station	Waterway	Type of Encroachment	Area Affected ha (ac)	Length Affected m (ft)
HEFP0010	19+690 - 19+885	Mississippi	Transverse	0.29 (0.71)	195 (640)
HEFP0020	19+725 - 19+985	Mississippi	Transverse	1.23 (3.03)	260 (853)
HEFP0030	20+065 - 20+115	Mississippi	Transverse	0.05 (0.12)	50 (164)
HEFP0040	20+115 - 20+440	Mississippi	Longitudinal	2.82 (6.96)	325 (1,066)
HEFP0050	21+685 - 21+710	Mississippi	Transverse	0.06 (0.15)	25 (82)
Subtotal				4.45 (10.97)	855 (2,805)
WAFP0010	38+840 - 39+300	S. Henderson	Transverse	2.45 (6.05)	460 (1,509)
Total				6.90 (17.0)	1,315 (4,314)

Source: Harding ESE, 2002.

Mississippi River Floodplain

The Mississippi River floodplain within the Henderson County portion of the project corridor (Figure 2-4) is protected by a levee that FEMA has accepted as adequate to protect against failure, including overtopping, for a 100-year flood or smaller. The FIRM map indicates a dual floodplain condition (Zones A and B) exists within the Mississippi River floodplain for Henderson County. Zone A consists of interior areas (protected by the levee) but are subject to flooding by local storm events. Drainage from the interior area of Henderson County Drainage Districts 1 and 2 is southerly to a single pump station at Carthage Lake south of U.S. Route 34. Zone A includes areas at elevations 158.5 m (520.0 ft) and lower. This flood condition is referred to below as interior floodplain. Zone B includes areas protected from a 100-year river flooding source by a levee (i.e., interior areas with elevation between the interior 100-year flood elevation and the River 100-year flood elevation). Except where specifically identified otherwise, the following discusses Zone A floodplains and conditions for interior flooding for 100-year frequency flood events (or less).

The preferred alternative encroaches the Mississippi River floodplain at five locations, HEFP0010, HEFP0020, HEFP0030, HEFP0040, and HEFP0050 for a total Mississippi River floodplain area of 4.45 ha (10.97 ac) and a total length of 855 m (2,805 ft) or 0.85 km (0.53 mi). The preferred alternative is proposed to be constructed a minimum of 0.9 m (3 ft) higher than the existing facility from the Carman Road interchange to the bluffs at TR164. This elevation is above the interior (Zone A) 100-year flood level. Cross-culverts will be replaced at similar locations to existing crossings so that existing drainage patterns will remain unchanged. Because the Mississippi River is in a general north-south direction while the proposed project is in a general west-east direction, all build alternates considered had to be located within the Mississippi River floodplains.

During the development of study alternates, a primary objective was to maximize, to the extent practicable, the existing right-of-way of U.S. Route 34. This objective was identified as a means to overall avoid and minimize impacts to the environment. At the locations where the preferred alternative encroaches upon Mississippi River floodplain, the preferred alternative maximizes the amount of existing right-of-way used. Improvements to the intersection at Carman Road results in floodplains crossings HEFP0010, HEFP0020, HEFP0030, and HEFP0040. Floodplain crossing HEFP0050 is located north of TR38. At this location, the preferred alternative is holding the south right-of-way and results in a minor encroachment immediately north of existing Route 34.

This portion of the study area was located in Section I for Phase II during the alternative development and evaluation. Alternate 1M2B was recommended as part of the preferred alternative. Other alternates were developed for Section I that required less floodplain area but were eliminated for the following reasons.

Alternates 1F2C and 1H2C utilized the least amount of existing right-of-way, required an additional interchange for the design year, impacted burial mounds, and had the highest number of farm residential displacements.

Alternates 1E2E and 1I2E required the greatest amount of right-of-way, required an additional interchange for the design year, impacted Botanical Site #3, had the highest impacts to wetlands, and had the highest impacts to woodlands.

Alternate 1B2B required two more at-grade crossings, impacted an additional three farm owners, impacted an additional two farm operations, displaced an additional six residences, and conflicted with several township roads which created access impacts to a high number of businesses/residences.

For a detailed discussion on alternative development and evaluation, see Section 3.0 of the DEIS.

A hydraulic assessment indicates impacts on the Mississippi River floodplains during floods larger than a base flood event (100-year frequency flood) would result in a minimal increase in flood heights and flood limits, a minor decrease in flood storage capacity, and a potential loss of conveyance (obstruction). The modifications to drainage structures and increase in road embankment height would result in an insignificant change in their capacity to carry floodwater. The 100-year Mississippi River flood elevation is approximately 163.41 m (536.0 ft), or approximately 4.6 m (15 ft) higher than the majority of the road grade in the Zone B area. The highly submerged proposed road embankment would present little additional obstruction to flow should the levee fail in event of a greater than 100-year river flood event and, therefore, result in an insignificant increase in flood elevation from downstream to upstream side of the proposed road. These minimal changes will not result in any significant adverse impacts on the natural and beneficial floodplain values. There will be no significant change in flood risks. There will be no significant increase in potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that these encroachments are not significant.

South Henderson Creek

The preferred alternative encroaches the South Henderson Creek floodplain at one location, WAFP0010, for a total floodplain area of 2.45 ha (6.05 ac) and a length of 460 m (1,509 ft) or 0.46 km (0.29 mi) (see Figure 2-3). Within the project corridor, South Henderson Creek is located in a general north-south direction while the proposed project is located in a general west-east direction. All build alternates considered had to be located within the South Henderson Creek floodplain due to the orientation of the creek within the project corridor. At floodplain crossing #WAFP0010, the preferred alternative is transitioning from the Biggsville bypass to existing right-of-way near TR190.

The South Henderson Creek crossing was located within Section II for Phase II during the alternative development and evaluation. Alternate 3G4B was recommended as part of the preferred alternative. Other alternates were developed for Section II but were eliminated for the following reasons.

- Alternates 3I4B and 3C4C were no longer considered due to the elimination of connecting alignments in Section I.
- Alternate 3H4C utilized only 1.2 ha (3 ac) of existing right-of-way, impacted the greatest amount of productive agricultural land, impacted the greatest area of woodlands, and had the highest amount of floodplain encroachment.
- Although Alternate 3E4B impacted about 0.13 ha (0.33 ac) less floodplain than the preferred alternate, Alternate 3E4B resulted in the highest number of displacements, incurred major utility impacts, raised safety concerns regarding traffic interaction with Union High School traffic, and impacted the highest number of intermittent streams.

For a detailed discussion on alternative development and evaluation, see Section 3.0 of the DEIS.

The proposed bridge at South Henderson Creek and associated impacts to floodplains have been re-evaluated since the issuance of the DEIS. Compliance with Illinois floodplain rules dictates that the proposed crossing at South Henderson Creek can create no additional increase in the 100-year floodplain. A longer bridge than originally proposed, with an approximate length of 200 m (656 ft), is now proposed to span nearly the entire South Henderson Creek 100-year floodplain. The revised design will not result in any significant adverse impacts on the natural and beneficial floodplain values. The revised design would have no impact on flood heights or flood limits. This revised design will not have a significant change in flood risks or damage nor have significant potential for interruption or termination of emergency routes. Therefore, it has been determined that this encroachment is not significant.

Finding

Based upon the studies conducted, it has been determined that the preferred alternative will result in floodplain encroachment, but is the only practicable alternative. The limits of the Illinois regulatory floodway will be determined during project design as there are no mapped FEMA floodways within the project corridor. This will ensure conformity with applicable State and local floodplain projection standards.

2.4 Mitigation Commitments

- Erosion control measures for highly erodible soils will consist of either vegetative soil stabilization or non-vegetative soil stabilization. Vegetative soil stabilization includes temporary seeding, permanent seeding, sodding, ground cover, or dormant seeding. Non-vegetative soil stabilization includes mulching and aggregate cover.
- Perimeter silt fencing and ditch checks will be used to protect adjacent properties during construction. Non-intrusion fencing will also be used in any active pastures to divert livestock from the affected area. Diversion of “clear” water flowing through the construction site away from disturbed areas will

be achieved by standard temporary diversion methodologies including ridge diversions (berms and dikes), and diversion swale/excavated type diversion.

- Maximize utilization of existing right-of-way to every extent practicable. Design standards utilized have minimized right-of-way requirements.
- Paralleling property lines to the greatest extent possible. This decreased the number of severance management zones (SMZs), severed farms and farm operations, and landlocked parcels.
- Partial access control design decreased adverse travel, landlocked parcels, and the amount of land necessary for frontage (or access) roads.
- Construction of field access points and at-grade crossings for farm machinery, where deemed practical.
- Widening field entrances at the request of the Illinois Farm Bureau, to allow room for semi-trucks to enter and exit from the fields.
- Maintenance of existing surface and subsurface drainage.
- Proper control of sedimentation and erosion to minimize loss of topsoil into streams and roadside ditches, as well, as from adjacent fields.
- During construction, field tiles draining to or intersected by the highway right-of-way will be located by means of trenching and the associated drainage will be accommodated to assure that proper field drainage is maintained.
- Uneconomical remnants acquired and landlocked parcels will be considered when choosing borrow pit locations.
- Uneconomical remnants acquired and landlocked parcels will be utilized as necessary for tree replacement. No additional right-of-way will be purchased for the sole purpose of tree mitigation or floodplain storage.
- Archaeological sites affected by the preferred alternative will be investigated further. Their National Register eligibility will be evaluated. If any of these sites are eligible for the National Register, a data recovery plan and a Statement of No Adverse Effect will be prepared and submitted to the State Historic Preservation Office for review and approval.
- Construction noise will be controlled in accordance with Article 107.35 of the IDOT Standard Specifications for Road and Bridge Construction.
- In an attempt to minimize the impact to Botanical Site #3 both the roots and seeds of the better species of plants, such as the wild blue larkspur and other prairie plants, will be relocated to a suitable area prior to construction. In addition the top 15 cm (6 in) of topsoil will be removed and stockpile until the desired grade is achieved.
- Drainage channels used as animal migration routes, as well as wetlands and streams, will be bridged or culverted thus preserving the existing corridors for aquatic and amphibious biota.

- Construction impacts on water quality will be minimized with the installation of appropriate erosion control in accordance with IDOT's "Joint Design/Construction Procedure Memorandum on Erosion and Sediment Control" prior to the commencement of activities that disturb and expose existing soil.
- Compensatory mitigation will be developed for unavoidable impacts to wetlands and other aquatic sites as required by the USACE and IDNR. Offsite (out-of-basin) wetland mitigation will be utilized for compensatory purposes. LaGrange Wetland Bank is located in Brown County, Illinois southwest of Beardstown. The LaGrange Wetland Bank is located in the LaMoine River drainage basin and is bounded by the LaMoine River to the north and the Illinois River to the east.
- Mitigation measures identified in the IDOT manuals, "Standard Specifications for Road and Bridge Construction" and "Special Provisions for Temporary Project Water Pollution Control" will be utilized to help reduce the effects of roadway construction on surface water resources. Those areas where erosion and sediment controls will require special consideration are presented in DEIS Table 4-16.
- A Tree Mitigation Plan will be prepared during final roadway design to provide guidelines for the replacement of trees removed greater than 6 inches in diameter due to construction impacts. A total of 3,428 trees within the proposed right-of-way will be mitigated for compensation purposes. Specifications regarding species selection, planting locations and planning methodology will be consistent with IDOT's Tree Mitigation Policy.